September 2022

# Challenger Wave

*Monthly newsletter of the Challenger Society for Marine Science (CSMS)*

## NEWS

**Off-shore wind will lead our journey to NetZero, but at what cost to our seas?**

In the 20 years since the first off-shore wind turbine was deployed off the northeast coast of England the off-shore wind sector has grown massively, with a current power generation capacity of ~ 10 GW (Giga-Watt). A consequence is that wind energy generation was estimated to account for 24% of total UK electricity requirement in 2020, and an industry with a turnover of £6 billion and employing over 7,000 people (Office of National Statistics).

Moreover, off-shore wind is seen as the backbone to the UK (and many other coastal nations) pathway to achieving NetZero by 2050. Ambitious targets for the expansion of off-shore wind are increasing each year. The UK is currently aiming to achieve a 50 GW generation capacity by 2030 (a 67% rise in the target set 12 months previously). This equates to over 20,000 new wind turbines in UK waters, at a cost of £50 billion and will create 100,000 new jobs nationwide.

Whilst over 99% of current UK off-shore wind farm development is based in shallow tidally turbulent and, in consequence, well mixed coastal seas, the proposed massive expansion requires large scale developments in the deeper seasonally stratifying seas further from shore, as already proposed in the North and Celtic Seas. This regime shift requires the development of alternative turbine foundation designs, with a switch from seabed fixed turbines to novel floating mountings, and implies a very different environmental response.

As discussed in a recent paper with colleagues from Hull, Cambridge, Liverpool, NOC, Plymouth and UEA, www.frontiersin.org/articles/10.3389/fmars.2022.830927/full, tidal flow past these floating structures will generate significant amounts of turbulence, leading to enhanced levels of mixing of heat and dissolved matter across the seasonal thermocline. We speculate that this mixing could result in the delay of the onset and early breakdown of seasonal stratification, the enhancement of primary productivity within the subsurface chlorophyll maximum, and locally increased ventilation of the oxygen replete deep water. These impacts point to significantly more fundamental consequences for the marine ecosystem than those associated with coastal wind farms.

*Lead author, Dr Robert Dorrell, Research Fellow, University of Hull*

In supporting the development of coastal wind farms much research has been carried out into the impact on the seabed, and on individual top predictor species, which has guided the planning process with the aim of minimising environmental impact.

The proposed development of deep-water floating wind farms in what are often considered some of the most biologically productive seas on the planet, the seasonally stratifying shelf seas, requires urgent research into the impacts of the new developments on these sensitive ecosystems in order to guide design and planning to ensure these vital new developments


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are environmentally sustainable. **– Prof. Tom Rippeth, School of Ocean Sciences, Bangor University**

**Climate Linked Atlantic Sector Science, CLASS, project opportunities**

*Berths available on CLASS expeditions*

The sustained observation expeditions have berths available for students and early career researchers (ECRs) to join them and make measurements or collect samples for projects in collaboration with CLASS researchers. Students and ECRs will receive support in collecting their data and samples at sea, gain experience in a range of seagoing activities and benefit from working closely with CLASS researchers.

ECRs can apply for a berth on a CLASS research cruise through one of three options:

a) A berth funded by the ECR's own project, to collect data and/or samples to carry out research that will enhance CLASS objectives.

b) A berth associated with a CLASS ECR Fellowship (see below) or a PhD with a CLASS Principal Investigator

c) A berth as a volunteer for the core science team. Some, but not all, CLASS cruises need volunteers for their core team of people who take samples and process data.

Details of CLASS cruises and deadlines for applications can be found in the Application Form on the CLASS website. ECRs considering applying for a berth on a CLASS cruise should contact the Principal Investigator (PI) to discuss their ideas and plans first. More information, including contact details for the PI, what you need to know, and where to send your form, is given in the Application Form, projects.noc.ac.uk/class-project/academic-engagement. Applications can be submitted at any time.

*CLASS Fellowships for Early Career Researchers*

CLASS has an ECR Fellowship scheme to support extended visits by graduate students or postdocs to NOC and SAMS. The purpose of CLASS ECR Fellowships is to support the career development of ECRs by enabling collaborative working with CLASS researchers, as well as access to CLASS facilities, data sets, model output and tools, and berths on CLASS cruises. The research carried out by the ECR during the Fellowship should enhance the CLASS objectives and build on the project's observations and/or modelling and/or technology development. Applications are invited for CLASS Fellowships at NOC and SAMS. The deadlines are given at projects.noc.ac.uk/class-project/academic-engagement.

# VIEWS

**NOC Scientist Spotlight: Dive into the Twilight Zone with Dr Adrian Martin**

From its extraordinary creatures, to its crucial role in how the ocean takes up and stores carbon, the ocean's Twilight Zone is a key research focus for scientists around the world. For August's National Oceanography Centre (NOC) Scientist Spotlight, they spoke to Dr Adrian Martin, from the Marine Systems Modelling group at the NOC, about the world-leading research into this poorly understood layer of the ocean, https://noc.ac.uk/news/scientist-spotlight-dive-twilight-zone-dr-adrian-martin.

*What drew you to working in this area?*

"It has a very appealing combination of being very varied, with huge amounts still unknown, and yet of real significance. The Twilight Zone is important to some of the hottest debates around how we use the oceans, such as deep-sea mining, carbon dioxide removal and fishing. Like marine science in general, it is also very welcoming, with none of the divisions between disciplines found in some longer-established fields of science. Much of the research involves collaboration between biologists, physicists, chemists, ecologists, computer programmers and technologists, and many researchers become a blend of these





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themselves. I started as a mathematician yet have been on over 10 expeditions to sea."

*What is your role in Twilight Zone research at the NOC?*
"The NOC is right at the forefront of international research into the Twilight Zone, particularly in addressing the question of how life in the sea helps the ocean store carbon that may otherwise be in the atmosphere. There are many projects looking at different aspects of this across the NOC, from PhD students to multimillion-pound projects involving multiple countries and institutes. I lead one project called CUSTARD, roses.ac.uk/custard, which is examining how the marine life of the Southern Ocean, a key junction for the "motorways" of the ocean circulation, helps the ocean store carbon. I am also the NOC lead on a European project called SUMMER, summerh2020.eu, which is focussed on the fish of the Twilight Zone. More broadly I lead a programme focussed on the Twilight Zone that is part of the UN Ocean Decade for Sustainable Development. The programme is called JETZON, jetzon.org, and brings together Twilight Zone researchers and projects from around the world."

*What impact does your science have on society?*
"My view is that science progresses best as a community. I can't claim my research immediately impacts the person in the street but what I research allows other scientists to explore the consequences of perturbing the Twilight Zone (e.g. through deep-sea mining), which in turn allows policy makers, such as governments, to make the difficult decisions that balance the need for new resources against the potential damage to the environment from extracting them. All parts of that community are necessary to achieve a sustainable approach to the ocean."

Visit the NOC Twilight Zone page to learn more**,** noc.ac.uk/science/under-the-surface/twilight-zone**.**

**Investment in Sonardyne's PIES shows confidence in marine seismic market**
Marine technology company Sonardyne has seen an uplift in orders for its Pressure Inverted Echo Sounder (PIES) technology into the exploration and reservoir surveillance market in the first half of this year. The announcement was made on the opening day of the International Meeting for Applied Geoscience and Energy (IMAGE) in Houston where the company was exhibiting.

Sonardyne's PIES technology, which helps geophysicists to better understand the physical processes that occur in the deep ocean, has been acquired by a string of companies performing both towed streamer and ocean bottom node (OBN) deployments, highlighting increasing activity in the sector. Among those investing in PIES are marine geophysics data and services company PGS Geophysical and ocean bottom nodal firm Magseis Fairfield. Geophysical services provider PXGeo has also ordered a number of Sonardyne's PIES.

*Investment in Sonardyne's PIES is a sign of improvement in the marine geophysics data market. Image from Sonardyne.*

PIES is a long endurance, self-contained oceanographic instrument for precisely measuring average sound speed in the water column as well as water depth information. By collecting these observations as seismic data is being acquired, PIES helps to reduce uncertainty in the imaging data, helping to provide a clearer image and guide operational decisions

"PIES continuously measure the two-way travel time of sound waves propagated through the water column from the seabed to the sea surface as well as the pressure (depth) at the seabed," explains Sonardyne sales manager Trevor Barnes. "This data is used to calculate a continuous time history of the average water velocity and tidal variation throughout the entire water column. By doing this, these environmental variations can be removed from the reservoir imaging data, providing geophysicists with a clearer image of their reservoirs."


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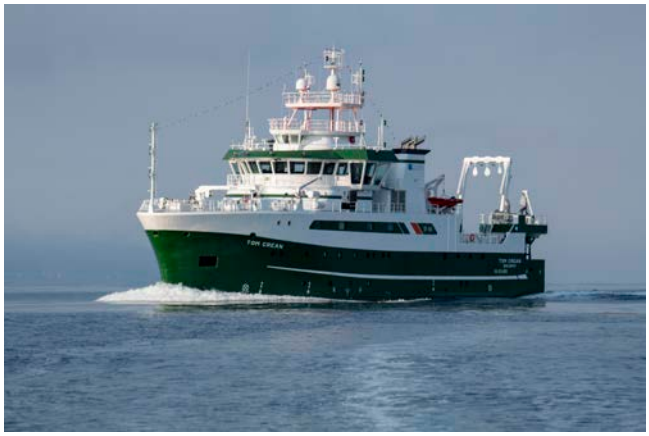
PIES are regularly used across the marine seismic market as well as by oceanographic institutions interested in understanding the ocean. The instrument can be deployed on the seabed by ROV or freefall deployed from a surface vessel and configured for autonomous monitoring campaigns lasting several months to several years. An embedded acoustic modem also allows users to retrieve data wirelessly on-demand, or adjust monitoring regimes, from crewed or uncrewed survey vessels. PIES can also be deployed in wired configurations, allowing a constant data feed to topside facilities.

**Sonardyne Ranger 2 acoustic tracking technology selected for new Irish research vessel**

Ireland's new state-of-the-art multi-purpose marine research vessel RV Tom Crean has entered service equipped with Ultra-Short BaseLine (USBL) underwater positioning technology from ocean science company Sonardyne.

Delivered in July, the 52.8 m-long vessel delivers significantly enhanced capability to Ireland's Marine Institute, www.marine.ie/, and other state agencies and universities. The RV Tom Crean provides up to 3,000 scientist days per year for fisheries surveys, seabed mapping, deep water surveys, oceanographic and environmental research. The Ranger 2 USBL positioning system selected for the RV Tom Crean will play a key role in underpinning the delivery of these ocean services on a national level.



*Marine Institute's RV Tom Crean set off on its first survey mission late July, complete with Sonardyne's Ranger 2 USBL system. Photo from Marine Institute.*

Ranger 2 can accurately track and simultaneously communicate with multiple underwater scientific instruments, vehicles or towed platforms, at ranges up to 10,000 m depending on its configuration. For vessels equipped with a dynamic positioning system, Ranger 2 also can provide accurate and repeatable position referencing, in any water, without interrupting target tracking operations. The equipment supplied to the RV Tom Crean includes a through-hull deployed HPT 5000 USBL transceiver, control room hardware and software, and a deep rated WSM 6+ transponder, a popular choice for tracking targets out to 4,000 m range.

In its primary role, the RV Tom Crean's science crew will use Ranger 2 to precisely monitor the position of any underwater platform deployed from the vessel. This includes the Marine Institute's remotely operated vehicle (ROV), Holland 1, autonomous underwater vehicles (AUVs), CTDs (conductivity, temperature and pressure sensors) and towed sleds and dredges, together with any equipment temporarily embarked to support science cruises.

Furthermore, the vessel will be able to share its underwater tracking and communications hardware with another of the institute's vessels, the RV Celtic Explorer, because it also has Ranger 2 on board. The RV Celtic Explorer has used a Ranger 2 system to great advantage since 2011, so much so that the Ranger 2 for the RV Tom Crean was one of the first items of science equipment to be procured.

Aodhan Fitzgerald, Research Vessel Operations Manager at the Marine Institute, says, "The Sonardyne Ranger 2 USBL system on the RV Celtic Explorer has served us well over the past decade, supporting some exciting scientific research. Consequently, the installation of Ranger 2 on the RV Tom Crean is a big increase in capability and considerably increases our flexibility to support the diverse community that use our ships for research."

Geraint West, head of science at Sonardyne, says, "Ranger 2 USBL is in service with national and not-for-profit ocean institutes the world over, supporting operations ranging from seafloor geodesy through to autonomous underwater vehicle (AUV) survey missions, in any ocean, in any water depth. Its capability and flexibility is invaluable to marine scientists and oceanographers where efficient use of vessel time and accuracy of observations are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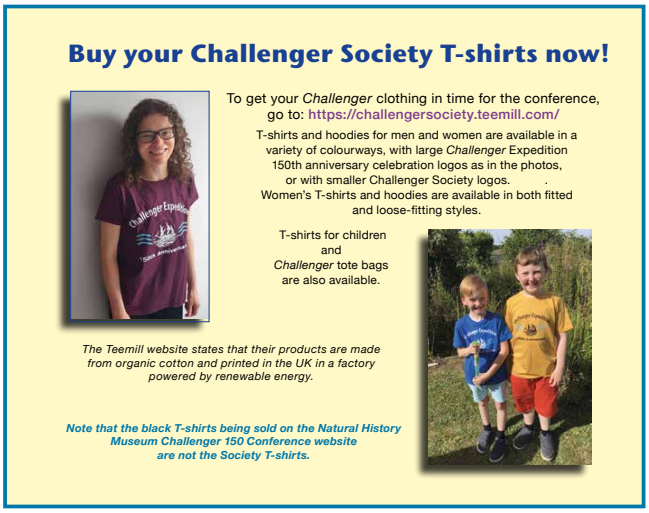
paramount. In a year when our Ranger 2 technology was used to help find the wreck of Ernest Shackleton's Endurance in the Antarctic, it's a timely entrance for the RV Tom Crean. He was one of Shackleton's right-hand men and is often unsung outside of Ireland. Crean was known for his dependability, resourcefulness and inspiration to others, an inspired choice then for the Marine Institute's new vessel."

The RV Tom Crean was designed by Norwegian ship design consultants Skipsteknisk AS and built by Spanish shipyard Astilleros Armon Vigo S.A. It will be a modern, multipurpose, silent vessel, able to go to sea for at least 21 days at a time, including in harsh sea conditions. The vessel replaces the 31 m Celtic Voyager, which was Ireland's first purpose-built research vessel when it was commissioned in 1997.

**Challenger Society merchandise store on Teemill**

Please visit challengersociety.teemill.com/ where you can browse, and even purchase items if you like. Please feel free to provide feedback in the help section.



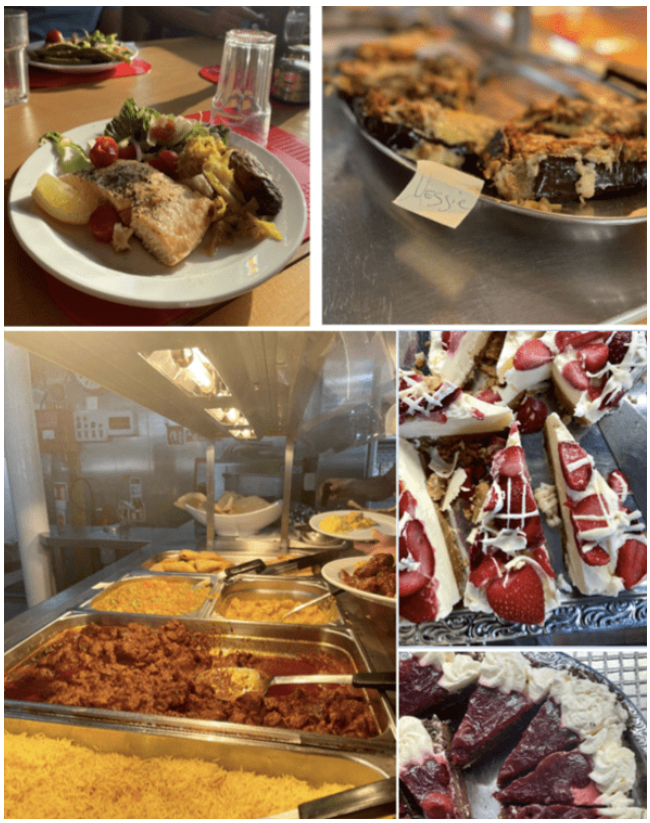

## SALTS

**Scran time! Are you feeling hungry?**

The RRS *James Cook* and her crew operate 24 hours a day. Whether it's steaming between scientific study sites, deploying instruments, collecting samples, solving technical problems, planning next missions, or making sure the ship runs smoothly, everyone on board does their bit and works hard.

However, everyone needs to eat. So what does the food aboard a scientific research vessel look like? This is probably one of the most frequently asked questions about life on board and admittedly is something I also wondered about before joining the ship. I think it's safe to say that we are incredibly spoiled and the food has been nothing short of fantastic.

Breakfast is served from 07:30 and usually consists of classic English breakfast items, a variety of nuts, yoghurt, cereal, fresh fruits, scones, croissants, you name it. We have proper coffee and tea (of course) available around the clock. Lunch can be anything from hearty pies, mac & cheese, baked veggies, and burgers, and is usually from served from 11:30 while we're at sea.



*Some culinary highlights from the past week: Salmon with vegetables and salad, a selection of curries, stuffed aubergines, strawberry cheesecake, and black forest cake.*

Dinner is by far my favourite and also when we get really spoiled (I'm talking dessert. every. day). We are yet to have an official vote, but the battle for the first place favourite is currently between fish & chips (Fridays) and curry nights (Saturdays). We also have steak nights, Asian-inspired nights and classic Sunday roast. Dessert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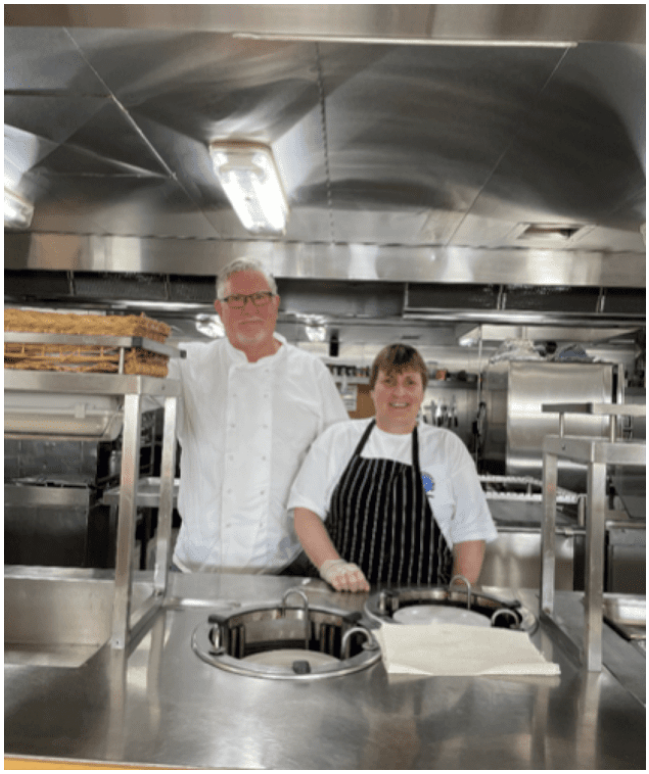
can be anything from waffles and ice cream, cheese cake, sticky toffee pudding, black forest cake, or apple crumble. Every meal is also accompanied by a selection of fresh salad ingredients and cooked veggies, so you really don't have an excuse for not getting your greens. Great effort goes into every meal, including special catering for different dietary needs.

So how do you keep a crew of 54 fed for five weeks?; meticulous planning. So much so that as soon as we arrive back in Southampton in September, orders are ready to be placed for the next cruise that will take place over Christmas season. A lot of special thought goes into this planning, for example making sure that the crew on board during this time will be able to enjoy foods characteristic of Christmas, making home feel a little less far away.



*Our fabulous chefs, Spike and Coleen. Thanks for looking after us so well. This cruise would not have been the same without you.*

I've been lucky enough to have been given a tour of the food storage facilities by head chef Spike and was blown away by all the effort that goes into planning meals and ordering of ingredients. While in port, ingredients arrive by truck and are carried off into one of four main storage freezers/fridges with different temperatures. One freezer is for meat, another for fish, and then there are fridges for dairy products, fresh fruit and vegetables. Temperature gauges are displayed outside each freezer and in the ships' engine room, so in the event of an electrical fault the engineers can act on it before anything goes to waste.

There's also a massive pantry stocked with a multitude of spices, cereal, pasta, biscuits, tea, coffee, spreads, jams, and sauces. Items with the shortest shelf life are used first: things like bananas, mange tout, and green beans, while potatoes and the like will easily see us through the entire cruise. Chef Spike tells me that the longest that the RRS *James Cook* can provide catering without re-stocking is about 6 weeks.

Menus for each week are put together in advance to help keep track of what needs to be taken out of the freezer and when. From there it goes to the preparation area in the galley and can be placed in the short-term use fridge if need be.

The galley is fitted with all the appliances you can think of. A combination oven that can either steam or dry heat, hot press, a giant mixer, more refrigeration space, two deep fryers, and many more. As I'm getting my tour, the chefs are busy preparing a lamb Rogan Josh sauce and chicken stock for curry night.

Feeding people in locations around the world has been a way of life for both of our chefs. Spike has worked in the catering industry for 40 years, many of which on ships. Before working on ships, chef Coleen spent about 24 years cooking for the British army. Having completed many trips with the army, including tours of Iraq, Afghanistan, Hong Kong, and many other locations, she is very much used to living out of a suitcase and I'm certain she'll be able to tell you a good story or two. I sure hope I get to hear more of her adventures during this cruise.

I'd like to conclude this article by extending a sincere thank you to our wonderful chefs and the hard work you put in every day. Your warm spirit paired by excellent food is a true highlight of each day for everyone on board. And last but certainly not least, thank you to Denzil, who works around the clock to keep everything in a spotless state (and for explaining some British slang to this South African!). **- Lisa Skein, on board JC237**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**RRS *James Cook* assisted in rescue of five people at sea**

French coastguards alerted HM Coastguard at 19.40 on Tuesday, August 30th, to a French fishing vessel 160 nautical miles south-west of the Isles of Scilly, which had suffered an electrical failure and was taking on water. After a distress signal was broadcast in the area, a number of fishing vessels and the UK's research ship, RRS *James Cook*, responded.

The crew of the damaged fishing vessel evacuated to a life-raft at first light on 31st August. They were then picked up by one of the other fishing vessels which had responded to the distress call. The RRS *James Cook* remained at the scene throughout and provided a vital communications link to HM Coastguard.

Jack Paterson, Senior Maritime Operations Officer for HM Coastguard, said: "We would like to thank all the vessels who responded to the distress call to help the fishing crew. This rescue is a perfect example of how we work with the maritime community, at home and abroad, to keep people safe."

# CALENDAR

**25th September-2nd October 2022: Ramon Margalef Colloquium 2022, Past, present and future of a living ocean**

*Barcelona. Spain*

A workshop hosted by the Institut de Ciències del Mar (ICM-CSIC). We have a limited understanding of the long physicochemical and biological evolution of the ocean. In a context of climate change, it is crucial to better understand the paleo-ocean and how it has evolved into the present ocean. That information would allow us to generate better predictions of the future ocean.

Thus, the main aim of this workshop is to bring together scientists from different disciplines, paleoceanographers, biogeochemists, conservation biologists, microbial ecologists, ecosystem modellers, geologists and physical oceanographers, in order to develop improved perspectives on the future ocean, based on knowledge from the past and present.

The RMSC2022 will promote synergies and dialogues between different disciplines as well as networking and knowledge exchange between senior, junior and next-generation researchers from different disciplines. Registration is now open and all information can be found at ramonmargalefcolloquia.com.

**5th-19th October 2022: Ocean Best Practices System (OBPS) Workshop VI**

*Virtual*

The OBPS announces that the Ocean Practices Workshop VI will take place virtually with plenaries on the 5th (opening plenary 1A), 6th (opening plenary 1B), and 19th (closing plenary) of October 2022 (each three hours long). Working Group sessions will meet in between, at times of their own choosing.

The Workshop will cover a broad range of topics proposed and selected by session leads and the workshop coordinators. For the plenaries, there are two general themes: 1) Guiding technology evolution and use, and 2) Capacity development and sharing, with an emphasis on developing countries. Let us know if you are interested in participating, or in proposing a theme or session for a Working Group, by filling out the Interest to Participate short form at docs.google.com/forms/d/e/1FAIpQLSc5MEiuWVNa5JXah47qoIdhKrDopmcY2bEzBcVu2MLrAATHJQ/viewform.

Please circulate this invitation to colleagues who may be interested in focused discussions; those who may want to learn more about developing, curating and sharing Ocean Practices; and to help plan the next three to five years of OBPS and its Ocean Decade programme: "OceanPractices". Should you have any questions, please e-mail us at info@oceanbestpractices.org. We look forward to hearing from you, Frank Muller-Karger, Chair, OBPS Workshop VI; On Behalf of the Ocean Best Practices System Steering Group

**11th-13th October 2022: 7th Argo Science Workshop**

*Brussels, Belgium*

This international workshop is hosted by Euro-Argo and will take place in the Royal Belgian Institute of Natural Sciences, Brussels, as a hybrid event with in-person and virtual attendance options.


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You will find further information on the workshop webpage, www.euro-argo.eu/News-Meetings/Meetings/Others/7th-Argo-Science-Workshop-October-2022.

**13th-16th October 2022: Arctic Circle Assembly**
*Reykjavik, Iceland*
Arctic Circle, www.arcticcircle.org, provides an open, democratic platform for discussion and cooperation on Arctic Affairs, for Governments, universities, research institutions, organizations, associations, companies and other partners.


Attended by more than 2000 participants from over 60 countries, the Assembly is the largest international gathering on the Arctic. Every year, participants can attend over 150 Sessions, receptions, art exhibitions, film screenings and more with various networking opportunities provided throughout the Assembly days.

**8th-10th November 2022: 12th MASTS Annual Science Meeting: Supporting the Blue Economy Vision**
*Glasgow, Scotland*
Scotland's blue economy includes the marine, coastal and the inter-linked freshwater environment of Scotland, the different marine and maritime sectors it supports, and the people connected to it. It also encapsulates the legislation, policies, programmes and international commitments that determine its management, as well as the under-pinning scientific research that provides data and information for evidence-informed policy development and is used to evaluate our success.

Join us as we celebrate our twelfth annual conference and discuss how to support the blue economy vision. The MASTS Annual Science Meeting is a cross-disciplinary event that brings together members of the marine science community, with the aim of promoting and communicating research excellence and forging new scientific collaborations. After hosting the ASM online for the past two years, Early bird registration will open in August.

The first two days will bring together expert plenary speakers and contributed talks, panel sessions and e-posters outlining the latest research and management practices that address key topics related to marine science and management in the face of global climate change. Alongside our general science sessions, the event will include special topic sessions, and plenty of opportunity to enjoy networking with your peers and making new contacts.

The third day will be devoted to workshops. Confirmed workshops to date include Scottish marine invasive non-native species workshop; and Improving Diversity & Inclusivity in Aquaculture. MASTS also look forward to co-hosting with the SUT, their annual "Decommissioning & Wreck Removal" workshop. This workshop will be open to all, and will take place on Thursday 10th November. However, there are more workshops in development, so more details will be coming soon.

We are delighted that IMarEST have kindly agreed to sponsor the student prizes for the 2022 ASM. Don't forget to stay up to date on the ASM by following us on Twitter or LinkedIn #MASTSasm2022. If you would like to get involved or have a query about the ASM, please drop us an email, masts@st-andrews.ac.uk. We would love to hear from you if you would like an exhibit space at the ASM.

**27th–30th November 2022: 2nd Springer MedGU Annual Meeting 2022**
*Marrakech, Morocco*


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The Mediterranean Geosciences Union, association.medgu.org/, in collaboration with Springer and Ibn Tofail University (Morocco) organizes the 2nd MedGU. Visit our website (www.medgu.org) to learn more about the event.

On this occasion, we are pleased to invite you to take part in the conference (in-person or virtually) and share/discuss your latest research findings. The MedGU Annual Meeting is one of the largest international geoscience meetings (200 attended in-person the MedGU-21 in Istanbul and 250 online). The MedGU Annual Meeting aims to provide a forum where geoscientists, especially early career researchers, can present and discuss their findings with experts in all fields of geosciences. It will feature talks and panels covering a diverse range of geoscience and geoscience-society topics.

The MedGU-22 encourages submissions of research works from all regions of the world. The MedGU-22 Proceedings will be published in Springer ASTI Series (indexed in Scopus & SCImago). Contact us, if you need more information, contact@medgu.org.

**23rd-28th April 2023: EGU General Assembly 2023**

*Vienna, Austria*

EGU23 invites you to take an active part in organizing the scientific programme of the conference, from now until 19 September 2022, by suggesting sessions with conveners and description in your preferred programme group. You have the possibility of proposing either physical oral/poster sessions with a hybrid component or hybrid vPICO sessions, meetingorganizer.copernicus.org/EGU23/provisionalprogramme.

When suggesting a session, Short Course, or Townhall Meeting, as a general guideline, we strongly encourage considering and promoting under-represented demographics, in particular including: (i) multiple countries and institutes, (ii) different career stages, with particular attention to the participation of Early Career Scientists, (iii) different genders and all other forms of diversity, and (iv) diverse scientific approaches. Please check with all conveners that they agree to take part in the proposed session. Please see the convener guidelines and rules for further information, egu23.eu/guidelines/conveners.html.

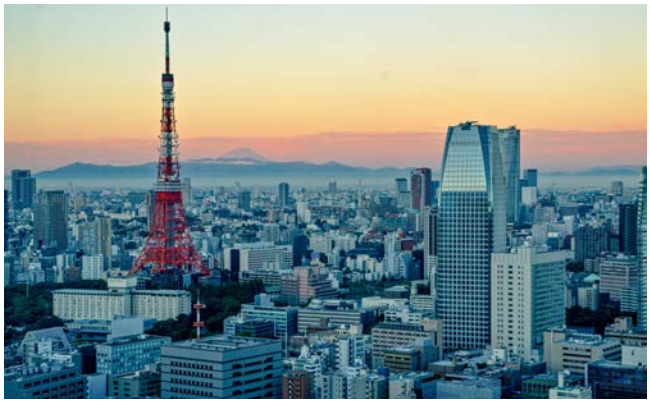
From 1st November 2022 until 20th January 2023 you can apply for Townhall Meetings. Townhall Meetings offer an active discussion platform that is open to all interested participants to inform them of new opportunities and initiatives. Rooms for a splinter meeting can be booked for smaller, targeted discussion groups. Splinter Meeting booking is open from 1st November 2022.

If you have questions about the appropriateness of a specific session topic, please contact the programme group chair and/or the officers of the specific programme group, www.egu23.eu/about/programme_committee_composition.html.

**4th – 6th November 2023: Arctic Circle Japan Forum**

*Tokyo, Japan*

The Arctic Circle is collaborating with the Sasakawa Peace Foundation in organizing the Forum. Governments, universities, companies, research institutions, organizations, associations and other partners were invited to submit proposals for Sessions. For more information visit www.arcticcircle.org/forums/arctic-circle-japan-forum.



The CSMS email address is info@challenger-society.org.uk. Contributions for next month's edition of Challenger Wave should be sent to: john@vectisenvironmental.com by the 30th September.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# JOBS and OPPORTUNITIES

**University of Bergen (UiB) invites talented researchers to apply for 23 postdoctoral fellowships.**


SEAS is a career and mobility fellowship programme for 37 postdoctoral research fellows within marine sustainability. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101034309.

Marine and coastal areas face multifaceted challenges, threatening biodiversity and humanity on a global scale. To have an impact on marine sustainability, there is an urgent need to integrate perspectives and insights from a diverse range of fields and sectors.

The University of Bergen's SEAS programme brings together a variety of aspects of marine sustainability, involving all UiB faculties, and many academic and non-academic partners.

The second call of the SEAS programme, www.uib.no/en/seas/155601/call-2-23-msca-seas-postdoctoral-research-fellow-positions, has an application deadline of October 31st, 2022.

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**There are jobs on the IMBER web site**

http://www.imber.info

IMBeR Integrated Marine Biosphere Research

## Jobs and opportunities

### New

- Open Call: POGO Shipboard Observation Training Fellowships, **6 Dec 2021 to 30 Nov 2022**. Apply now
- Project Manager/Research Associate: FishSCORE, Gulf of Maine Research Institute, Maine, USA. Apply by **23 September**
- Research Assistant (Early career scientist): Securing protection for threatened sharks and rays, WILDTRUST, Durban, South Africa. Apply by **23 September**
- Research Officer: Climate System Analysis Group, University of Cape Town, South Africa. Apply by **30 September**
- Postdoc: Assessing social and environmental linkages wrt distant water fisheries, Arizona State University, Apply by **7 October**
- PhD: Political factors impacting Integrated Oceans Management, UTAS, Hobart, Tasmania. Apply by **10 October**
- Call for proposals: Collaborative coastal research, Robin Rigby Trust. Apply by **31 October**
- 2023 Simons Early Career Investigator in Aquatic Microbial Ecology and Evolution Awards. LOI deadline **4 November**

### In case you missed it...

- Postdoc: Arctic Marine Biodiversity, University Centre, Longyearbyen, Svalbard, Norway. Apply by **20 September**
- Communications Officer: JPI-Oceans, Brussels, Belgium. Apply by **21 September**
- Postdoctoral fellowship: Marine Genetics, Cape Town, South Africa. Apply by **14 October**
- Postdocs (23): Marine Sustainability: SEAS programme, University of Bergen, Norway. Apply by **31 October**
- Funding: Future Earth Communication Grants. Submit proposals by **31 October**
- Research data analyst: Stanford Centre for Ocean Solutions
- Postdoc fellowship: Analysis of Atmospheric Carbon Removal Strategies, Scripps Institution of Oceanography
- Science officer: Past Global Changes (PAGES), Bern, Switzerland. Open until filled

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